REMARKS

Claims 1-4 are now in this case. Claim 1 has been amended to specify that the electron emitters comprise carbon nanotubes and that the separate layers are aligned and then bonded. Claims 5-12 have been canceled as directed to nonelected species. All claims have been rejected.

Claims 1 and 3 have been rejected under 35 U.S.C. § 102 as anticipated by Wells et al., U.S. Patent No. 6,391,670. These rejections are believed inapplicable to the claims as amended.

It is well established that for a prior patent to anticipate a claimed invention, the patent must disclose each and every limitation of the claim.

In the present case, amended claim 1 calls for "carbon nanotube electron emitters." It further calls for forming separate cathode, gate and anode layers, vertically aligning and spacing them and then bonding them together. Wells et al., which uses sharpened semiconductor emitters and a self-aligning milling process is devoid of any disclosure of these claimed features. Accordingly, Wells et al. does not anticipate claim 1 or its dependent claims, including claim 3.

Claim 2 has been rejected under 35 U.S.C. § 103 as unpatentable over Wells et al. in view of U.S. published application 2002/0137242 to Gilton. This rejection is traversed.

For a combination of prior patents to make obvious a claimed invention, the patents must teach or suggest each and every limitation of the claim.

Here claim 1 calls for carbon nanotube emitters and the formation of separate cathode, gate and anode layers that are vertically aligned before bonding. The cited references are devoid of these claimed features.

Applicant's specification teaches that microwave vacuum tube devices, such as power amplifiers, are essential components in a variety of microwave systems including telecommunications, radar, electronic warfare and navigation systems (Specification,

p.1). It further points out that such devices are desirably miniaturized microscale dimensions. However this miniaturization presents manufacturing problems (p.2, 3rd Par.):

> "While transistors have been miniaturized to micron scale dimensions, vacuum tubes have been much more difficult to miniaturize. This difficulty arises in part because the conventional approach to fabricating vacuum tubes becomes increasingly difficult as component size is reduced."

To over come these difficulties, the specification teaches a new approach:

> "...a cathode layer is fabricated with an array of electron emitters (preferably carbon nanotubes); a gate layer is made comprising an array of openings to pass electrons from the emitters; and an anode layer is made with one or more electrode regions to receive electrons from the emitters. The cathode layer, the gate layer and the anode layer are vertically aligned and bonded together on a silicon substrate with intervening spacers so that electrons from the emitters pass through the gate openings to the anode layer."

As pointed out above, this method is not disclosed by Wells et al. which first forms a composite structure then etches portions away by ion milling to form self-aligned structures. Wells thus teaches away from applicants approach which forms separate layers, separates them with spacers, aligns the components vertically and bonds them all together. Gilton cited only for sharpened silicon emitters does not remedy the deficiencies of Wells. Accordingly, claim 1 and its dependent claims including claim 2, patentably distinguish from Wells and Gilton, individually or in combination.

Claim 4 has been rejected under 35 U.S.C. § 103 as unpatentable over Wells et al., Gilton and Karpov U.S. Published Application 2002/0146853. However Karpov, cited only for an electron multiplying structure, does not remedy the deficiencies of Wells and Gilton. Accordingly claim 4 (dependent on claim 1) patentably distinguishes from all cited references for the same reasons as claim 1.

In view of the above it is respectfully submitted that claims 1-4, as amended, patentably distinguish from all cited references. Accordingly this application now fully complies with the provisions of 35 U.S.C. Sections 102 and 103 and is now in condition

for allowance. Reconsideration and favorable action in this regard are therefore earnestly solicited.

Respectfully submitted,

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